

SYNTAX

SERVING TIMEX-SINCLAIR
PERSONAL COMPUTERS

A PUBLICATION OF **THE HARVARD GROUP**

VOL. 4 NO. 8

ISSN 0273-2696

AUG., 1983

IN THIS ISSUE

8K Programs	
Archer.....	18
Return on Investment...	6
Spelling Word Game....	15
Book Review	
<u>The Timex Personal</u>	
<u>Computer Made Simple,</u>	
<u>Mastering Your Timex</u>	
<u>Sinclair Personal</u>	
<u>Computer.....</u>	15
Classified Ads.....	22
Dear Editor.....	12
Dueling Devices.....	21
Hardware Review	
Winky Board II.....	10
New Products.....	2
News.....	1
POKE Down And	
Abbreviated SAVE/LOAD.	18
Program Clarifications..	3
Program Improvements....	3
Set RAMTOP	
Automatically.....	9
Software Review	
Copy Katt.....	14
Timex Makes	
Medical Waves.....	16
TS2068 Specs.....	6
User Friendly	
Legal Advice.....	14
Users' Groups.....	4
Vendor Report	
And Notes.....	20
<u>Index of Advertisers</u>	
Byte-Back.....	17
E-Z Key.....	15
Loeser, William M.D....	19
Memotech.....	11
Mnemosyne.....	7
Random Access.....	9
Suntronics.....	5

TIMEX: 16K TS2000 SCRAPPED; SOFTWARE DEALS

Timex will produce only 48K RAM versions of the TS2000, called the TS2068, says Timex spokesman Carl Folta. The \$199 TS2068 will experience further delays, with release now set for the middle of September. Folta gave no reason for the plan changes. In other news, Timex will offer a software deal--buy two, get two free, starting in August.

ZX84 IN THE WORKS

Sinclair Research plans in mid-1984 to introduce the ZX84, a new microcomputer using Sinclair's flat 8" CRT and microdrives, reports the Dutch periodical Elektronica (6/1/83). Later this year, Sinclair plans to introduce the \$60 microdrive, a new type of memory that can store more than 100K bytes of data; up to eight drives can run on one computer. Sinclair may also offer the microdrive to Spectrum users. Sinclair Research denied comment on the news, saying the info is classified.

EXCUSE ME, THAT'S SIR CLIVE

Queen Elizabeth II of England knighted Clive Sinclair on June 11, honoring his accomplishments as inventor of the ZX/TS computer. Sir Clive said the event inspires him to achieve further success for Britain.

GOODBYE, SQ

SQ and SYNTAX staffers regretfully announce that SYNTAX QUARTERLY magazine has ceased publication, due to financial difficulties. We express sincere appreciation and thanks to all who contributed to, read and supported SQ. We hope you will extend this support to SYNTAX, so we can continue to provide ZX/TS users with a high-quality publication. Subscribers will shortly receive a letter offering valuable product alternatives to SQ.

NEW PRODUCTS AND SERVICES

INVENTORY program for small businesses or collectors. Keeps track of assets. Tape, instructions \$10. MAGIC WORLD SOFTWARE, POB 1184, Olympia, WA 98507.

Consulting services for software marketers: contract negotiations, product packaging advice, legal assistance. Electronic Media Associates, 161 W. 15th St., Suite 7E, NY, NY 10011, 212/620-3964.

Expect new TS books this fall. New American Library and dilithium Press contracted for a new computer book series, including 51 Game Programs for the TS1000 & 1500 by Tim Hartnell (due in Sept., \$2.50) and Things to Do with Your TS2000 by Jerry Willis and Merl Miller (due in Nov., no price set).

Floating point extension for XFORTh available in Sept., \$15 +\$1 P&H, 4% AR res. tax. XFORTh XCHANGE, forum for XFORTh, FORTH-79 users, free with HAWG WILD product info. Send ideas, questions. XFORTh XCHANGE, c/o HAWG WILD Software, POB 7668, Little Rock, AR 72217.

Aircraft Performance charts climb rate vs. airspeed to compare performance with varied altitude, weight, power, \$7.95. 16K listing, specs for 250 aircraft from Bob Fingerle, POB 7793, Fremont, CA 94537-7793.

TS1000 64K RAM under \$100. Gladstone Elec., 1585 Kenmore Ave., Buffalo, NY 14217, 716/874-5510.

Programmer's Pipeline maintains software listings for buyers and sellers. Buyers--\$150/yearly for mailings and database access. Sellers--\$20/listing. Ask for free Checklist for Program Authors (send large SASE, mention SYNTAX). Programmer's Pipeline, POB 666, Glendora, CA 91740, 213/914-4317.

Free info on producing instruction manuals for software, electronics. Manual printing/production services also available. Rudy Molho, Counsel Press, 30 E. 40th St., NY, NY 10016, 212/689-1303.

MATH TEACHER drills students through jr. high level. Covers the four basic math operations. Needs 16K RAM. \$29.95, CompuTech, Dept. TS-MT-STX, POB 7000-309, Redondo Beach, CA 90277, 213/375-6391.

World Users Exchange collects and sends ideas, info. to users groups. Publishes reports, newsletter. Free, World Users Exchange, POB 12132, Roanoke, VA 24022.

Family Health Records program keeps medical records, 16K, 64K versions. \$12.95 includes P&H (83¢ tax NY res.), Pyramid Software, POB 813, Pearl River, NY 10965.

LODAB merges 2 BASIC programs, occupies 1.4K. BASIC area memory chart displays memory used and remaining. BDLs deletes, copies blocks of BASIC lines, occupies 3/4K. Both in ML, self-starting, automatically reset RAMTOP, need 16K. Use together or separately. \$18.00 ea., THE ULTIMATE BLACKWOOD, POB 7427, Santa Cruz, CA 95061.

MIJID Software trade show for personal computers in Cannes, France, Oct. 3-7. U.S. rep. Harvey Seslow-sky, 100 La Fayette Dr., Syosset, NY 11791, 516/364-3686.

SyncWare News bimonthly newsletter for TS electronic/math/physics applications, with focus on technical program listings, tutorials on computer use, tech. subjects, hardware mods. \$15/yr. SyncWare Co., POB 5177, El Monte, CA 91734.

Chemistry Tutor teaches intro chemistry concepts. 16K, cassette \$16. H.R. Brady, 301 Pine St., Neptune Beach, FL 32233.

Computer graphics conference "Applications on the Leading Edge," Oct. 24-25. Presentations for engineers, architects, artists, doctors. For info contact Conference Secretary, 2nd Annual Pacific Northwest Computer Graphics Conference, 111 Susan Campbell Hall, U. of Oregon, Eugene, OR 97403-1204, 503/686-5555.

TimeWare product line--8 books, 7 game tapes, 6-vol. cassette series to teach kids math. Software needs 16K, runs on TS1000, 1500. Reston Publishing Co., 11480 Sunset Hills Rd., Reston, VA 22090, 800/336-0338, or TS stores and bookstores.

FYLITtm provides user-generated custom database applications--file configuration, multi-field sorting. Requires 64K, CAI P40 printer, CAI Exatron stringy floppy. 50-ft. wafer \$30. Free catalog. BIOCAL SOFTWARE, 167 Wilson St., Petaluma, CA 94952, 800/237-8400 x70.

Fantasy Plaza software "shoppes" include TS software, hardware. Order by modem (1-213-244-1100), phone plaza operator #12, (800/824-7888, 800/824-7919 AK, HI) or shop by mail. Fantasy Plaza, POB 6055, Burbank, CA 91510.

GRADEBOOK records grades, weights scores, does statistical analysis. Tape \$12.95. EPHEMERIS V planet finder reports location of any celestial body, computes lunar phases, includes graphics. Tape \$14.95. Both 16K. S&H \$1.25/order, \$10/Express Mail. Robotec, 59 C St., Ampoint Industrial Pk., Perrysburg, OH 43551, 419/666-2410.

Microcomputer Programs in Print software reference guide, includes Timex and independent TS software. Includes 280 software categories. Money back guarantee. Ppbk., 208 pp. \$22.25 includes tax, S&H. Postroad Press, Inc., POB 1212, Roanoke, VA 24006, 703/342-9797.

PROGRAM CLARIFICATIONS

GOLF PARTNER (Jul.83) does not compute golf handicaps (lines 735-745) according to US Golf Association guidelines. The USGA formula averages the ten lowest differential scores (gross golf scores minus course ratings) of your last 20 rounds, multiplies the average by 0.96, and rounds off to the nearest whole number. Rev. Glass' formula averages the ten most recent gross scores, subtracts 72, multiplies the difference by 0.85, and rounds down to the nearest whole number.

John Carson, Jr., Takoma Park, MD

Substitute GOTO 80 for GOTO 75 in line 60 of WEATHER FORECAST (Jul. 83) for proper programming technique. Although the program lacks a line 75, the listing as printed works. ZX/TS computers jump to the next higher line (80) when they

PROGRAM IMPROVEMENTS

As noted in Jun.83, my BASIC Syntactic Sum (Feb.83) can give a different result than the MC version when checking long programs. This improvement gives the same result as the MC version, whatever the program length.

Just enter these lines at the end of your program, then GOTO 9600 to calculate the Syntactic Sum.

```
9600 FAST
9601 LET S=0
9602 LET K=65536
9603 FOR A=16509 TO PEEK 16396+2
9604 LET S=S+PEEK A
9605 NEXT A
9606 LET S=S-K*INT (S/K)
9607 PRINT "S=";S-10310
9608 STOP
SYNTACTIC SUM: 10310, 8K ROM
```

If you want to use this program with different line numbers, first enter it by itself, using your line numbers and replacing the 10310 at the end of line 9607 with a single 0. RUN it and jot down

the value of S. Then enter the following program, using the S value you wrote down for the value of D in line 10:

```

5 REM --- USE THE NUMBER YOU
WROTE DOWN IN PLACE OF XXX WHEN
YOU TYPE LINE 10
10 LET D=XXX
15 LET E=D
20 LET D#=STR# D
25 LET V=PEEK 16400+256*PEEK 1
6401
30 LET F=0
35 FOR N=1 TO 5
40 LET F=F+PEEK (V+N)
45 NEXT N
50 LET C=0
55 FOR N=1 TO LEN D#
60 LET C=C+CODE D#(N)
65 NEXT N
70 LET S=E-28-1+LEN D#+F+C-D
75 LET G=ABS S
80 IF G<=30 AND G/3=INT (G/3)
THEN PRINT D,S
85 IF S=0 THEN STOP
90 LET D=D+1
95 GOTO 20
SYNTACTIC SUM: 22228, 8K ROM

```

Make sure your machine is in FAST. RUN, then go dry the dishes or walk the dog. When you return, the computer should show a 0 in the right column. Substitute the corresponding number in the left column for the 0 in the next-to-last line of Syntactic Sum. DELETE the second program and RUN Syntactic Sum. Now S should equal 0.

If the second program never gives you a 0, press BREAK. (If no numbers appear on the screen, enter CONT and press BREAK again later.) Pick the smallest absolute value in the right column. Divide it by 3 and reverse the sign (multiply by -1). Change the three K variables in lines 9602 and 9606 to the letter that number ahead of or behind K in the alphabet. For example, if the number is +2, change K to M (K +2 letters = M). Revise the next to last line as explained in the previous paragraph (substitute the corresponding number...).

Lloyd Painter, Quakertown, PA

To execute 8K MC Video Invert (Jun. 83) more easily, enter this loader

program (line 1 contains 28 characters after REM):

```

1 REM ABCDEFGHIJKLMNOPQRSTUW
XYZAB
10 FOR A=16514 TO 16541
20 INPUT X
30 SCROLL
40 PRINT X,;CHR# X
50 SCROLL
60 POKE A,X
70 NEXT A

```

RUN, then input the decimal numbers from Jun.83, p.21. After the last number, delete lines 10-70. To use the routine, enter RAND USR 16514.

Stephen Brothers, Aurora, CO

ZX/TS USERS' GROUPS

To list your group or find one in your area, call or write SYNTAX.

Portsmouth, OH: R. Arthur Gindin, 1823 Kinneys Ln., Portsmouth, OH 45662, 614/354-2525.

Cincinnati, OH: Timex/Sinclair Users Group of Cincinnati, Rick Johnson, 11 Funston Ln., Cincinnati, OH 45218, 513/825-1449.

Pittsburgh, PA: Pittsburgh Area Computer Club, Special Interest Group--Timex/Sinclair. New address and leader: Ed Mihalo, 152 Deerfield Dr., Pittsburgh, PA 15235, 412/795-7694.

Oologah, OK: Billy Casebeer, T/S Users Group, POB 372, Oologah, OK 74053. Interested in hearing from ZX/TS owners in any area.

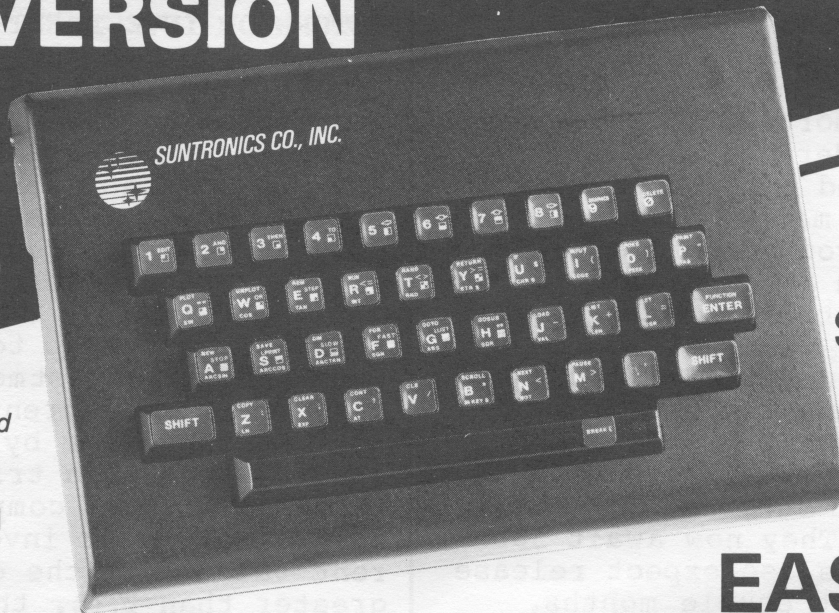
Sheridan, WY: John E. McWilliams, Sheridan Microcomputer Users Group, Rt. 2, Box 511, Sheridan, WY 82801, 307/674-4954. Includes ZX/TS users.

Newark, DE: Julio C. Bezerra, 371 Moir St., Newark, DE 19702, 302/834-6565.

S. Bound Brook, NJ: Amateur Computer Group of New Jersey, POB 319, South Bound Brook, NJ 08880.

FULL SIZE KEYBOARD CONVERSION

FOR
YOUR
ZX-81/
TS-1000



Only
\$69⁹⁵

Fully Warranted
For 90 Days!

SUN KD-81

If you're tired of not knowing whether your data got entered or tired of poking data in with one or two fingers, then it's time to upgrade your ZX-81 to a full size, professional keyboard. The **SUN KD-81 KEYBOARD** offers all the ease and comfort of inputting your programs and text on a fast and efficient professional-sized keyboard!

KD-81 FEATURES

- Full size keyboard with 41 keys
- Two color silk-screened key tops for easy reading
- Key tops have commands and graphics spelled out the same as ZX-81
- Extra shift key for real keyboard-style typing
- Full size space bar
- Allows touch typing
- Rear cutout allows any RAM or expansion module to be plugged in
- Keyboard comes with own cables
- Keyboard case holds both keyboard and computer with room to spare
- High impact plastic case with vaporized metal shielding
- Easy assembly — no soldering, no modifications
- Measures 10³/₄" x 7¹/₄" x 2¹/₈"

DEALER INQUIRIES WELCOME

GET A BETTER PICTURE WITH SAMWOO MONITORS

SAMWOO provides a much better picture for your Sinclair Computer than your TV monitor. Simple modification procedure includes easy-to-follow instructions.



9" 18Mhz BANDWIDTH
Green \$121.00
Orange 125.00



12" 12Mhz BANDWIDTH
Green \$130.00
Orange 134.00

Add \$7.50 Shipping and Handling for this item.

Features:

- Composite Video Input/Output
- Switchable Input Impedance 75 or 10K ohm
- 750 Line Resolution at Center and 500 Lines at Corners
- Dimensions are 12.13" x 11.34" x 11.65" for the 12" model and 8.66" x 8.54" x 9.05" for the 9" model

EASY TO INSTALL

- No Soldering
- No Modifications

Simple installation steps included with each kit.



RAM MODULES

- Built-in output connector for piggyback
- Lip for mounting on ZX-81 & KD-81
- High-impact plastic case with vaporized metal shielding
- 6.6" wide, 3.2" high, 1.08" deep

16K \$49.95 MX-16KP
64K \$119.00 MX-64KP



SUNTRONICS CO., INC.

12621 Crenshaw Blvd., Hawthorne, CA 90250
STORE HOURS: MON.-FRI. 9:00 am to 6:30 pm
SATURDAY 10:00 am to 5:00 pm

CALIFORNIA
213-644-1149

(for Tech Info and Calif. orders)

OUTSIDE CALIFORNIA TOLL FREE
1-800-421-5775

(Order Desk Only)

Mail Order — Minimum Order \$10. Send Money Order or Check to P.O. BOX 1957 — HAWTHORNE, CA 90250. VISA or Mastercard (please include expiration date). Add \$4.00 postage and handling to order. CA residents add 6% sales tax.

TS2068 SPECIFICATIONS

Although Timex's new TS2068 will appear shortly, they have kept most specs under close wraps. SYNTAX gathered this information about the new machine.

Onboard you'll find a Z80A processor with a new design for multimegabyte bank-switchable RAM. A new Sinclair flat-pak logic chip with 68 pins is bonded directly to the board. General Instruments' AY38912 sound chip provides three voices and a single envelope.

Timex has sent the ROM for manufacture. They now await 500 prototype units, so expect release within the next couple months.

Electronically, the keyboard works like the TS1000, but mechanically it resembles the Spectrum. Keys with indented tops and home-row dots on two keys allow easier touch-typing. Large moveable keys give tactile feedback; an internal speaker provides audio feedback.

Six of the buffered edge connector pins provide red, green and blue video output plus intensity and ground. Modulated video goes to your TV through a coaxial connector like the TS1000's.

Timex plans to make several unspecified languages available.

According to our report, the cassette input has automatic level control and works reliably at 1200 baud, adjusting for recorder speed using a tone header.

Your TS2068 will use a full bit-mapped graphics display of 256x192 pixels, with one bit of attribute per pixel (yielding 6K of attribute memory and 6K of pixel memory). It has a 64-column mode. You can get 512x192 pixels by setting up two display files, and an 80-column display is possible. The hi-res video copies character pictures onto a hi-res screen (a method used by Apple's Lisa).

All driven by a hefty power supply with 1A extra power and still under \$200.

RETURN ON INVESTMENT--8K/16K

What percentage return do your investments earn? If you play the stock market or own mutual funds, you may not know the rate of return from multiple investments. This program computes compounded annual rates of return on single investments and monthly annuities. RETURN calculates up to 20 single and four annuity investments, which you can make at different times.

RETURN works by calculating a figure based on a trial rate of return. It then compares this number with your investment's current value. If the difference is greater than 0.1%, the computer picks another trial rate and repeats the computation. This iterative process (repeated adjusted trials until arriving at the correct response) is a perfect time-saving application for computers.

Type in the program and RUN. For your first entry, don't re-evaluate loaded data (previous entries) when asked. Hit N for No and the program asks you for the month, date, year and amount of your first single investment. Hit 0 then ENTER to exit this data input section when desired. After you exit the single investment section, the program asks for monthly annuities. After you ENTER information on these, hit 0 then ENTER. The screen then blanks as the computer calculates. Be patient, and you will see your rate of return and ending balance displayed (the margin of error). An ending balance of \$1 on a \$1000 investment means your investment may actually fall between \$999 or \$1001.

Press Y when asked if you want to SAVE the data to tape. Then, you can recalculate your return rate later with a new monetary value of your investments. The program self-runs after you SAVE your data. You cannot enter more info if you SAVE and recalculate existing data.

Hit N if you don't want to SAVE your data, generating report code 9 (STOP). Press RUN to start another round of investments.

If you want to enter more than 20 single investments, change the number 20 in lines 1240 and 1320 to the number desired. To enter more than four annuities, change the first numeral four in line 1250 to the number of annuities desired, and change the numeral four in line 1530 to the same quantity.

Program limitations: calculations stop if the rate of return is less than 1%. The program computes only gains, not losses. Computation time can take awhile, partly because the program accurately calculates the number of days between two dates (lines 30-150, 300-420, 510-630) for more exact results.

To achieve a greater accuracy than 0.1%, first convert the desired accuracy to a fraction. For example, represent 0.05% accuracy with the fraction 5/10,000. Then multiply this fraction by the term in line 690. The line reads as follows, with changes highlighted: 690 IF ABS (C(4)-Y)<5C(4)/10,000.

Russell Crum, Canton, MI

```

10 REM RETURN ON INVESTMENT
20 REM R.CRUM MAY 8,1983
30 DIM N(12)
40 LET N(1)=0
50 LET N(2)=31
60 LET N(3)=59
70 LET N(4)=90
80 LET N(5)=120
90 LET N(6)=151
100 LET N(7)=181
110 LET N(8)=212
120 LET N(9)=243
130 LET N(10)=273
140 LET N(11)=304
150 LET N(12)=334
160 GOTO 1070
170 LET Y=0
171 LET FLAG1=0
172 LET FLAG2=0
180 FAST
190 GOTO 250
200 REM SINGLE SUM VALUE
210 LET Z=L*((1+A)**K
220 RETURN
230 REM ANNUITY VALUE
240 LET Z=L*((1+A)**K-1)/A
250 RETURN
260 REM SINGLE INVESTMENTS
270 IF B=0 THEN GOTO 480

```

M N E M O S Y N E

601 West Cliveden Street
Box A206
Philadelphia, PA 19119

WHY PAY \$49 ??

T/S 1000 -- ZX81

ASSEMBLER/SOURCE EDITOR/LOADER

Assembler handles all source statements & lists to TV or printer. Editor features move/delete block, find string/tag & scroll functions. Loader (650 baud) saves source files & your machine programs independent of BASIC. And your programs can access load/save routines...

send

\$14.50

(cheque or money order)

inquiries welcome

```

280 FOR I=1 TO B
290 LET K=0
300 FOR X=A(I,3) TO C(3)-1
310 LET K=K+365
320 IF INT (X/100)*100=X AND IN
T (X/400)*400<X THEN GOTO 340
330 IF INT (X/4)*4=X THEN LET K
=K+1
340 NEXT X
350 IF A(I,3)=C(3) THEN LET K=3
65-K
360 IF INT (A(I,3)/100)*100=A(I
,3) AND INT (A(I,3)/400)*400<A(I
,3) THEN GOTO 380
370 IF INT (A(I,3)/4)*4=A(I,3)
AND A(I,1)>2 THEN LET K=K-1
380 IF INT (C(3)/100)*100=C(3)
AND INT (C(3)/400)*400<C(3) THEN
GOTO 400
390 IF INT (C(3)/4)*4=C(3) AND
C(1)>2 THEN LET K=K+1
400 LET K=K-N(A(I,1))-A(I,2)
410 LET K=K+N(C(1))+C(2)
420 IF A(I,3)=C(3) THEN LET K=K
-365
430 LET L=A(I,4)
440 GOSUB 200
450 LET Y=Y+Z
460 NEXT I
470 REM ANNUITY INVESTMENTS
480 IF C=0 THEN GOTO 580
490 FOR I=1 TO C
500 LET K=0
510 FOR X=B(I,3) TO C(3)-1
520 LET K=K+365
530 IF INT (X/100)*100=X AND IN
T (X/400)*400<X THEN GOTO 550

```

```

540 IF INT (X/4)*4=X THEN LET K
=K+1
550 NEXT X
560 IF B(I,3)=C(3) THEN LET K=3
65-K
570 IF INT (B(I,3)/100)*100=B(I
,3) AND INT (B(I,3)/400)*400<B(I
,3) THEN GOTO 590
580 IF INT (B(I,3)/4)*4=B(I,3)
AND B(I,1)>2 THEN LET K=K-1
590 IF INT (C(3)/100)*100=C(3)
AND INT (C(3)/400)*400<C(3) THEN
GOTO 810
600 IF INT (C(3)/4)*4=C(3) AND
C(1)>2 THEN LET K=K+1
610 LET K=K-N(B(I,1))-B(I,2)
620 LET K=K+N(C(1))+C(2)
630 IF B(I,3)=C(3) THEN LET K=K
-365
640 LET L=B(I,4)
650 GOSUB 230
660 LET Y=Y+Z
670 NEXT I
680 REM CHECK BALANCE
690 IF ABS (C(4)-Y)<C(4)/1000 T
HEN GOTO 890
700 IF FLAG1 THEN GOTO 760
710 LET A=A
720 LET A=((A+A/2) AND (C(4)>Y)
)+(A-A/2) AND (C(4)<Y))
730 LET FLAG1=1
740 LET U=Y
750 GOTO 830
760 IF FLAG2 THEN GOTO 810
770 IF SGN (C(4)-U)=SGN (C(4)-Y
) THEN GOTO 710
780 LET A=A+(A-R)*(ABS (U-C(4))
/ABS (Y-U))
790 LET FLAG2=1
800 GOTO 830
810 LET A=(A+A*((C(4)-Y)/C(4))
AND (A+A*((C(4)-Y)/C(4))>=A/2))+
(A/2 AND (A+A*((C(4)-Y)/C(4))<A
/2)
820 IF A<.00000273 THEN GOTO 860
830 LET Y=0
840 GOTO 260
850 REM END
860 SLOW
870 PRINT "RATE OF RETURN <1 PE
R CENT"
880 GOTO 940
890 SLOW
900 PRINT "RATE OF RETURN ON IN
VESTMENT IS"
910 PRINT INT (((A*36500)+.5/1E
2)+1E2)/1E2;" PER CENT"
920 PRINT "ENDING BALANCE AT TH
IS RATE IS"
930 PRINT "$";INT (((C(4)-Y)+.5
/1E2)+1E2)/1E2
940 PRINT
950 PRINT "ANY MORE CALCULATION
S?(Y OR N)"
960 INPUT R$
970 IF R$="Y" THEN GOTO 1240
980 PRINT "WANT TO SAVE DATA?(Y
OR N)"
990 INPUT R$
1000 IF R$="N" THEN STOP
1010 CLS
1020 PRINT "PREPARE TAPE RECORDER"
1030 PRINT "PRESS ""CONT"" TO SA
VE"

```

```

1040 PAUSE 4E4
1050 SAVE "RETURN"
1060 GOTO 30
1070 LET A$="THIS PROGRAM COMPUT
ES RETURN ON INVESTMENT, UP TO 2
0 SINGLE SUM INVESTMENTS AND UP
TO 4 MONTHLY INVESTMENTS (SUMS A
ND DATES) MAY BE PUT IN, YOU MUS
T ALSO PROVIDE THE CURRENT VALUE
OF THE INVESTMENTS, THE PROGRAM
MAY BE SAVED WITH THE DATA AND
LATER RE-CALCULATED WITH A NEW C
URRENT VALUE, MONTHLY INVESTMENT
S ARE ASSUMED TO CONTINUE TO THE
CURRENT DATE, PRESS ""0"" AND ""
ENTER"" TO EXIT A SECTION OF DA
TA INPUT"
1080 FOR I=32 TO LEN A$ STEP 32
1090 FOR J=0 TO 32
1100 IF A$(I-J)=CHR$ 0 THEN GOTO
1120
1110 NEXT J
1120 PRINT A$((I-31) TO (I-J))
1130 LET I=I-J
1140 IF (I+32)>LEN A$ THEN GOTO
1160
1150 NEXT I
1160 PRINT A$((I+1) TO )
1170 PRINT
1180 PRINT "PRESS ""CONT"" TO CO
NTINUE"
1190 PAUSE 4E4
1200 CLS
1210 PRINT "WANT TO RE-EVALUATE
LOADED DATA?(Y OR N)"
1220 INPUT R$
1230 IF R$="Y" THEN GOTO 1750
1240 DIM A(20,4)
1250 DIM B(4,4)
1260 DIM C(4)
1270 LET B=0
1280 LET C=0
1290 LET A(1,3)=3000
1300 LET B(1,3)=3000
1310 REM INPUT
1320 FOR I=1 TO 20
1330 CLS
1340 PRINT "SINGLE INVEST NO. ";
I
1350 PRINT "MONTH? (2 DIGITS)"
1360 INPUT A(I,1)
1370 PRINT A(I,1)
1380 IF A(I,1)=0 THEN GOTO 1530
1390 PRINT "SINGLE INVEST NO. ";
I
1400 PRINT " DAY?(2 DIGITS)"
1410 INPUT A(I,2)
1420 PRINT A(I,2)
1430 PRINT "SINGLE INVEST NO. ";
I
1440 PRINT " YEAR?(4 DIGITS)"
1450 INPUT A(I,3)
1460 PRINT A(I,3)
1470 PRINT "SINGLE INVEST NO "; I
;" AMOUNT"
1480 INPUT A(I,4)
1490 PRINT A(I,4)
1500 PAUSE 200
1510 LET B=I
1520 NEXT I
1530 FOR I=1 TO 4
1540 CLS
1550 PRINT "MO. INU. NO. "; I
1560 PRINT " MONTH BEGIN (2 DIG
ITS)"

```



```

1570 INPUT B(I,1)
1580 PRINT B(I,1)
1590 IF B(I,1)=0 THEN GOTO 1750
1600 PRINT "MO. INV. NO.":I
1610 PRINT "DAY?(2 DIGITS)"
1620 INPUT B(I,2)
1630 PRINT B(I,2)
1640 PRINT "MO. INV. NO.":I
1650 PRINT "YEAR BEGIN (4 DIGIT
S)"
1660 INPUT B(I,3)
1670 PRINT B(I,3)
1680 PRINT "MO. INV. NO. ":I:" A
MT"
1690 INPUT B(I,4)
1700 PRINT B(I,4)
1710 LET B(I,4)=(B(I,4)*12)/365
1720 PAUSE 200
1730 LET C=I
1740 NEXT I
1750 CLS
1760 PRINT "CURRENT MONTH?(2 DIG
ITS)"
1770 INPUT C(1)
1780 PRINT C(1)
1790 PRINT "CURRENT DAY?(2 DIGIT
S)"
1800 INPUT C(2)
1810 PRINT C(2)
1820 PRINT "CURRENT YEAR?(4 DIGI
TS)"
1830 INPUT C(3)
1840 PRINT C(3)
1850 PRINT "CURRENT VALUE OF INV
ESTMENTS?"
1860 INPUT C(4)
1870 PRINT C(4)
1880 LET A=.000263
1890 PAUSE 200
1900 CLS
1910 GOTO 170
SYNTACTIC SUM: 45026, 8K ROM

```

SET RAMTOP AUTOMATICALLY

This program automatically sets your machine up for machine code routines in high memory by moving RAMTOP. I don't like to figure a new RAMTOP by hand, then POKE the right number into the right location. This program does it for you, displaying the new RAMTOP and the two numbers to POKE. To POKE RAMTOP yourself, write down the numbers in the box and POKE them, following the example on pp.124-5 (Chap. 25, Using Machine Code) of the Timex manual. Or the computer will POKE them for you. Enter and run AUTO RAMTOP before entering your other programs.

Another handy use: suppose your program uses 4K RAM. To speed it up, enter the number of bytes not used (subtract the number used

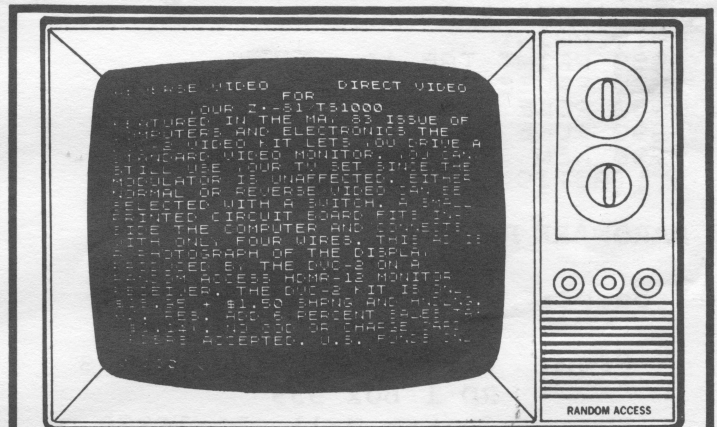
from 32768 if you have 16K) or enter 1024 times the number of K not used. For example, your program is 4K bytes long; you have 16K RAM. Enter 1024*12. Then LOAD and RUN your program--it runs faster.

SAVE the program before it RUNs to avoid the line 995 wipeout.

Variables

RT RAMTOP
 BYTES How many bytes in routine (number to subtract from RAMTOP)
 NA New Address to locate RAMTOP
 RE Remainder after dividing NA by 256*A (See lines 60&230)
 A Whole number to multiply by 256 and add to RE to get NA
Graphics and Inverse Video
 line 800 graphics E 17 graphics 7 graphics R
 line 810 graphics 5 graphics 8
 line 820 graphic W 17 graphic 6 graphic Q
 line 960 "DONE"

Todd Montague, Graham, WA



HDMR-12 VIDEO MONITOR/RECEIVER \$99.95

THE HDMR-12 IS THE PERFECT COMPANION TO THE SINCLAIR ZX-81/TS1000. A FLIP OF A SWITCH CHANGES IT FROM A NORMAL 12" B & W RECEIVER TO A HIGH DEFINITION MONITOR. INPUT IMPEDANCE IS 75 OHMS WITH A SENSITIVITY OF 1.0 VOLT PEAK TO PEAK. INTERFERENCE FROM LOCAL T.V. STATIONS IS TOTALLY ELIMINATED IN THE MONITOR MODE AND CHARACTER DEFINITION IS ASTOUNDINGLY SHARP. ADD \$8.50 SHIPPING AND HANDLING PER MONITOR. WE CANNOT SHIP MONITORS OUTSIDE THE CONTINENTAL UNITED STATES. ARIZONA RESIDENTS ADD 6% SALES TAX (\$6.00). WE CANNOT ACCEPT COD OR CHARGE CARD ORDERS. ALLOW 4 TO 6 WEEKS FOR DELIVERY. CERTIFIED CHECK OR MONEY ORDER SPEEDS DELIVERY.

RANDOM ACCESS

BOX 41770
 PHOENIX, ARIZONA 85080

```

5 SLOW
10 LET RT=PEEK 16388+256*PEEK
16388
20 PRINT TAB 10;"RAMTOP=";RT
30 PRINT
35 PRINT "HOW MANY BYTES IS YOUR ROUTINE?"
40 INPUT BYTES
45 PRINT
50 PRINT TAB 10;"BYTES LONG=";
BYTES
55 LET NA=RT-BYTES
60 LET A=NA/256
63 PRINT
65 PRINT "MAKE RAMTOP=";NA
70 LET A#=STR$ A
100 FOR X=1 TO LEN A#
110 IF A#(X)="." THEN GOTO 200
120 NEXT X
200 LET A#=A#( TO X-1)
210 LET A=VAL A#
230 LET RE=NA-256*A
300 PRINT AT 8,3;"
810 PRINT AT 9,3;"")AT 9,21)"
820 PRINT AT 10,3;"
830 PRINT AT 9,4;NA;"=";RE;" +25
6*";A
840 PRINT
850 PRINT
860 PRINT "DO YOU WANT MEMORY SET TO ";NA;"?"
870 LET Q#="INKEY#
880 IF Q#="Y" THEN GOTO 950
890 IF Q#="N" THEN GOTO 999
900 GOTO 870
950 PRINT
960 PRINT TAB 11;"DONE"
970 PAUSE 80
980 POKE 16388,RE
990 POKE 16389,A
995 NEW
SYNTACTIC SUM: 44014, 8K ROM

```

HARDWARE REVIEW

Product: Winky Board II tape filter and duplicator
From: G. Russell-Electronics
RD 1 Box 539
Centre Hall, PA 16828
Price: \$19.95 assembled
\$14.95 kit + \$1 S&H

Winky Board's designer bills it as a tape sound conditioner that lets you save bad tapes and copy any ZX/TS tapes, but Winky copies better than it saves.

Proper matching of the impedance of two recoders results in the board's duplicating success. Output for most cassette decks is 4-6 volts at 8 Ohms (speaker). Desired input is typically in millivolts at

600-1000 Ohms (microphone). Winky Board matches these, letting you exactly duplicate any tape.

While the duplicating feature works all the time, the SAVE feature is only marginal. Two LED indicators show when your recorder reaches proper recording levels. On really poor tapes, the light is hard to discern. If neither LED lights even a little, your tape is too bad even for Winky to save. Winky helped me load about 50% of my extensive bad tape collection. Some of the unloadable ones contained speed distortions; the board cannot do anything for those. Winky Board filters the tape data to eliminate computer or RAM pack interference frequencies.

Kit assembly seems improved over Winky Board I; you need to solder only 3 joints in this passive device. Considering its simplicity, I recommend you buy the kit. You get a simple high pass filter (resistors and capacitors), two indicator LEDs and an impedance matching network of resistors. One miniplug and three jacks provide input, load and duplicate output levels and an eavesdropping point. Manufacturer Bill Russell enclosed the jacks to correct an initial problem in Winky Board I of a loose jack touching exposed metal.

Despite its drawbacks, this product can pay for itself with one use if you save an otherwise unsaveable program.

Paul Donnelly, Centerport, NY

We found Winky II helps find the correct LOADING volume because the LED lights at that point. You can shorten LED#1's life by turning the volume too high. It doesn't blow, but it gradually burns out.

LOADING instructions were good and easy to follow, but the other procedures were a bit sketchy. For example, we weren't sure in the double-SAVE hook-up diagram where to connect the computer.--RWK

The Direct Connection is Here . . .



. . . for your Timex-Sinclair computer. Memotech can now connect you to CompuServe with our new modem package. With this introductory offer you get a 300 Baud J-Cat Modem by Novation. . . RS232 serial interface with built-in communications software and all connecting cables. PLUS, you get a CompuServe Demopak, password, I.D. and log on/off procedures for a free two hour demonstration of the CompuServe Information Service.

Memotech, the leader in add-on Timex products, introduces the modem package for only \$199.95 + \$6.95 shipping/handling. (Suggested value \$290.00).

Simply plug in our direct connect add-on products to the back of your Timex computer. The Memopak 16K sells for \$49.95 *. . . 32K Memopak is \$99.95 * and our best seller 64K Memopak is \$149.95 *.

The Memotech keyboard is priced at \$99.95 *. The Centronics parallel interface sells for \$74.95 * including software, and the RS232 interfaces are \$99.95 *. Printer packages are also low, low priced.

Order at no risk (10 day money-back guarantee); Call 1-800-662-0949 (Colorado 1-303-986-1516). Or send your name, address, phone number and a check/money order/Visa or MasterCard number with expiration date to:

Memotech Direct Sales Division
7550 W. Yale Avenue, Denver, Colorado 80227

* Shipping/Handling \$4.95; Colorado Residents add applicable sales tax.

DEAR EDITOR:

During the hot summer months, store your ZX printer aluminum printouts in a dry place. My program printouts developed black spots when kept in a humid basement, making them unreadable.

Richard Bryan, Falmouth, MA

I discovered an easy fix to an annoying problem. One of my ZX81 keyboard's foil tracks broke between the keyboard and its connector; a likely consequence of some recent modifications to my computer. Using the schematic in SQ (Winter82 p.47) I located the bad track, and replaced the missing section with aluminum foil. First, I placed some tape on the foil to provide enough stability when trimming. I taped this foil bridge over the defective track with plenty of overlap on the good portion of the conductor.

My keyboard works like new, and I saved myself the hassle of a repair charge.

Ken Hartgrove, Miami, FL

Do you know of any products to reduce or eliminate interference? My video display wavers when cars drive past, or when someone runs a large appliance.

Myron Felckowski, Stevens Point, WI

Any number of things could fix this problem. Try separating your components, buying power backup supplies (SYNTAX Jul.83 p.7), using a different TV, or hooking up a monitor instead of a TV.--KO

Operating manuals for the CAI Interface Module and ESF Stringy Floppy indicate that the 8K-16K memory locations must be available for the system. It works fine with my 16K Sinclair RAM module, but not with my JRS 64K RAM pack. Do you

know of some way to modify my JRS to open up the 8K-16K area?

Jim Alderson, Santa Paula, CA

Prevent the RAM CS from selecting the memory in these address spaces. See the decoding description for 64K RAM packs in SQ Summer 83.--KO

Three other ZX/TS owners and I discovered an unusual way to solve our LOADING problems. When replacing all four tape recorder batteries failed to fix bad LOADs in my ZX81 kit, I used two new and two weak batteries in my GE tape recorder. I have done this for a year with no problems--whenever the batteries need changing, I leave the two most recent batteries in and add two new ones.

My three friends use TS1000s and Panasonic or Sony tape decks, with similar results.

Paul G. Allain, Gardner, MA

If you run the recorder from an adjustable DC supply, you'll find a range of voltages over which it operates well. You can then build a fixed regulated supply whose voltage equals the square root of the product of the maximum and minimum voltages at which the machine loads.--KO

Hardware tip: The pin jacks for power, mic and earphone contain very weak springs, sometimes causing you to lose programs just from touching the power cable. I unsoldered the jacks and replaced them with better ones from Radio Shack--ordinary panel jacks. Although I had some difficulty wrapping a wire around them to solder to ground and solder the tab into the circuit, this solution works. Result--not one power loss in a year, and I can pick it up or shake it without fear of lost programs.

Robert Jenkins, Chicago Heights, IL

After attempting to perform some of the floating point examples given in Toni Baker's book How to Program the ZX81 in Machine Language, I realized that some of the call addresses given for various floating point routines in the ROM are incorrect for my ZX81. Can you explain this?

Michael Stokes, Tullahoma, TN

ZX81s built before late 1981 contained ROM bugs. When correcting the problem, Sinclair offset all code in the new ROM by three bytes after 0EEFh. See SYNTAX (Nov.81 p.7) for the newer 8K ROM map. We know no errors in Toni's book. Anyone else?--AZ

Do you know of an interface to connect my ZX81 to the MPI (Micro Peripherals Inc.) Mod. 51/52 Flexible Disc Drive with 500K storage? It's designed to run with computers such as those from IBM, Texas Instruments, or Radio Shack, which have their own power supply and I/O cable terminating in 34-pin PCBA edge connectors.

Harry D. Graham, Kingston, NY

Aerco sells the products you need: FD-FX Floppy Disk Interface (plugin) for \$179, and DP-2 power supply for \$79. The power supply provides the needed voltage for each drive of 5V at 1-1/2 Amps and 12V at 2 Amps. Aerco, POB 18093, Austin, TX 78760, 512/385-7405.--LFV

I have two 16K RAM modules (one is a TS1016) that can't piggy-back to form 32K. How can I combine the two to get more memory?

David Pinto, Jensen Beach, FL

You must perform some hardware mods to merge your RAMs. While we can't detail a complete solution, we can tell you that a RAM pack knows its address by the way address lines

and RAM CS are connected. If you arrange to divert RAM CS from one RAM pack to the other, you cause the first to be active between 16K and 32K and the second to function from 32K to 48K. See SYNTAX (May82 p.5) for circuit hints.--KO

Can you POKE new lines into a program without BREAKing and LISTing the new line number? I can find the address after any program line number by PEEKing 16425, but attempts to POKE into addresses after those holding the last character in the line causes a crash or POKES characters onto a blank screen. Any ideas?

Tim Lichtenwald, San Francisco, CA

Ideas yes, methods no. We made a quick pass at POKEing to the edit file, but that didn't work. You could create a bank of REM statements with sufficient room to hold new names, then automatically POKE them to active statements. You'll find the basic method for changing commands in SYNTAX (Feb.81 p.12), but now you have a more complex address-finding scheme to develop. We know the ROM contains a routine to insert BASIC lines, but we don't know how to use it. If any reader can help us, we'd be grateful.--KO

How can I convert the English ZX Spectrum to US television standards? Neither Timex, Sinclair, or Ferranti carry the part I need (Ferranti ULA #114, or equivalent). Can you help?

Rick Barnett, Woodbridge, VA

We know of no additional sources, but you can run your Spectrum in black and white on many US TVs. Also, you can buy a PAL-standard TV or monitor that can accept various color standards like the \$600 JVC TM-14PSN. For the monitor, you must also use direct video just as you would for a ZX/TS.--KO

SOFTWARE REVIEW

Program: Copy Katt
Purpose: Making backup tapes
Price: \$3/listing
\$1/disassembler listing
ROM/RAM requ'd: 8K/16K
Language: MC
From: Katt's Computers
Box 162
Chicago, IL 60411

Copy Katt lives up to its advertised claim of being able to copy any ZX/TS software, including machine code unlistable programs.

You must enter the 130-byte machine code program (sold as a listing) into a REM statement. Use the short loader program provided and you can use Copy Katt in about the time it takes to enter 300 keystrokes. The disassembler listing appears to load the various registers with high memory pointers (over 32K) and then boots up into the high memory areas.

Copy Katt sets itself up when RUNning and begins the ROM tape loading subroutine. When the tape you want to copy LOADS, COPY KATT automatically BREAKS and LISTs it, letting you SAVE it the usual way.

Fast delivery rates an A: I received my two-page program listing and instructions in less than a week after placing my order.

Three suggestions for improvement: include the assembly language listing as part of the Copy Katt package, mention in Copy Katt ads that the routine only works for 16K programs, and include instructions on adaptation to 2K machines.

I highly recommend Copy Katt and give it a 10 on my 1 to 10 scale of cost-for-value.

Paul Donnelly, Centerport, NY

See the Winky Board hardware review and the article "User Friendly Legal Advice" for further discussion about copying software and related legal concerns.--LFV

USER FRIENDLY LEGAL ADVICE

To get the best protection against program-idea theft, you must construct a patchwork shield out of laws governing copyright, trade secrecy and licensing or sales. Courts usually deny patents to computer programs because they do not fit the legal requirements of being "novel" or "nonobvious."

By comparison, you can copyright your program easily, cheaply, and effectively. Simply put the copyright symbol or the word "copyright," the year and your name on the cassette label and in the program's first line. (See ARCHER in this issue.) You must independently copyright any documentation you write as well. You establish a valid copyright the moment you place the copyright notice on any work. But to enforce your rights if you wish to sue for infringement on your copyright, you must file your copyright with the government. Write to the Public Information Office, United States Copyright Office, Library of Congress, Washington, DC 20559, and request Class TX application forms. Send in the completed form with a \$10 fee and a program print-out.

Copyright laws protect your program as a whole, but not necessarily ideas embodied in your program, such as subroutines. Protect these as trade secrets by including a trade secrecy clause restricting what a buyer can do with your program. A typical trade secrecy clause might prohibit the user from disclosing the program to any third party, by sale or by giving copies away. You can take legal action if the program's user violates any of these requirements. Imposing trade secrets if you directly market to the public might not be wise as it could cut into your product sales.

Jonathan Wallace, Esq., 51 E. 42nd St., Suite 1601, NY, NY 10017
Part II coming in Sept. SYNTAX--LFV

SPELLING WORD GAME--8K/2K

As a lazy parent, I devised this spelling game to tutor my daughter in the words she must learn each week for school.

Type in the program, and RUN then ENTER. You'll see an "L" prompt; enter five words scrambled and then five correctly spelled words in the same order. Press ENTER after each entry. (No indicator tells when to go from the scrambled to correct spellings.) The screen instruction then tells you to unscramble the word below. When you're through with the five words, decide whether you want to play again. A yes answer lets you play using the same words again. To begin another round with new words, press RUN.

SPELLING WORD GAME makes spelling practice more enjoyable for my daughter; the game provides visual encouragement and rewards her with more words to try when she's right.

Adults can enjoy this by playing cryptoquote or other scrambled word games.

Frederic Bogar, Key West, FL

```

5 REM "SPELLING"
10 DIM A$(10,8)
20 DIM S$(1,8)
30 FOR N=1 TO 10
40 INPUT A$(N)
50 NEXT N
70 FOR X=1 TO 5
75 PRINT "UNSCRAMBLE THE WORD
BELOW"
78 PRINT
80 PRINT A$(X)
90 INPUT S$(1)
100 LET Z=X+5
110 IF A$(Z)=S$(1) THEN GOTO 13
5
120 PRINT "WRONG, TRY AGAIN"
130 GOTO 90
135 PRINT "YOU ARE RIGHT--KEEP
GOING"
140 PRINT A$(Z)
141 FOR C=1 TO 35
142 NEXT C
145 CLS
150 NEXT X
155 PRINT "WANT TO PLAY AGAIN?"
156 PRINT "PUSH C, THEN ENTER"
160 STOP
170 GOTO 70
SYNTACTIC SUM: 24308, 8K ROM
    
```

**NOT JUST A KEYBOARD REPLACEMENT
BUT AN ENHANCEMENT THAT GIVES
KEYBOARD FEATURES FOUND ONLY
ON MORE EXPENSIVE COMPUTERS.**

*Join the
Click!*

**FOR FASTER & EASIER DATA ENTRY
WITH YOUR E-Z KEYBOARD . . .**
Here at last, is a large 60 key "TACTILE FEEL" keyboard that plugs into the same connectors as the existing keyboard on your ZX81, TIMEX/SINCLAIR 1000 or 1500. **HERE THE CLICK . . . FEEL THE SNAP!** for every key pressed (tactile feedback)

IT'S THE ONLY KEYBOARD WITH ALL OF THESE FEATURES:

- 60 moving keys, solid (not rubber)
- Legends in three colors on the base (color coded by key function)
- Molded legends on keytops (no stickers)
- 8 automatic shift keys (no shifting required) for edit, delete, single & double quotes, colon, semi-colon, function and stop
- 2 shift keys
- Numeric keypad
- Space bar
- No wiring required (Just plug in!)

Cables and instructions are included.



Measures 10" x 4" x 1 1/2"



A custom designed aluminum enclosure (shown above) is available for your E-Z Key keyboard.

Measurements:
EC-11 (11" X 9" X 3 1/2") Price: 24.95
EC-14 (14" X 9" X 3 1/2") 29.95
JOYSTICK: 29.95

A joystick kit that requires no wiring and functions like the arrow keys and 0 on your computer. Plugs into E-Z Key 60 keyboard.

\$84.95

90 day warranty

Take advantage of this introductory offer . . .
**\$10 OFF THE PURCHASE OF A JOYSTICK
WHEN YOU BUY THE KEYBOARD & ENCLOSURE**
(Prior purchasers will be honored for Joystick discount)

Try it, you'll like it--10 day return privilege on keyboard enclosures and keyboard in stock.

SWITCH SPECIFICATIONS
Keypads measure 0.4 by 0.3" spaced at 1/4" intervals between keys. Life equals 10 million operations (typical). Force equals three ounces. Double-throw button type with arm to give extended travel.

USE THIS ORDER FORM:
DCheck/MO CVisa CMasterCard

Qty.	Item	Unit Cost	Item Total	S & H Unit Cost	S & H Total
	E-Z Key 60	\$84.95		\$3.95	
	EC-11/EC-14	\$24.95/\$29.95		\$4.95	
	Joystick	\$29.95		\$3.95	
		Sub totals			
		Mass. residents add 3% sales tax			
		Grand total:			

Card # _____
Exp. Date _____
Send to _____

E-Z KEY

Suite 75, Dept. CE
711 Southern Artery
Quincy, Massachusetts 02169
(617) 773-1187

Signature _____
Name _____
Address _____
City _____ State _____ Zip _____

BOOK REVIEW

Title: The Timex Personal Computer Made Simple
Author: Joe Campbell, Jonathan D. Siminoff, Jean Yates
Publisher: Signet/The New American Library
P.O. Box 999
Bergenfield, NJ 07621
Price: \$3.50 (ppbk., 152 pps.)

Title: Mastering Your Timex Sinclair Personal Computer
Author: Tim Hartnell and Dilwyn Jones
Publisher: Bantam Books, Inc.
414 E. Golf Rd.
Des Plains, IL 60016
Price: \$3.95 (ppbk., 208 pps.)

Each of these books costs less than other ZX/TS books because of their small size and cheap paper. I recommend both books for their price alone, though Hartnell and

Jones wrote a much clearer book than Campbell et al.

As its name might imply, Made Simple seems to talk down to the reader. The text tries to keep things light and breezy, and includes many cartoons. Despite this, I found the book confusing, with too much text and too few demonstration programs.

After two short how-to-plug-it-in chapters, the book moves quickly into five chapters that explain some programming concepts, then progresses into four chapters of programs. The book's six appendices include computer anatomy, resources, a glossary, report codes, and troubleshooting.

Program listings in regular type pose problems. For example, no slash in numeral 0 confuses it with letter O in some listings. By contrast, Hartnell and Jones give you over 65 programs for less than \$4 with a lot of valuable information in Mastering Your Timex. Their underlying attitude seems different from Campbell's-- they assume you want to learn and work hard to help you. As founder/coordinator of the National ZX Users' Club of England, Hartnell brings to this book his experiences working with Sinclair users.

This book contains short chapters that cover beginning programming concepts, plus such topics as PEEK and POKE, MOVING GRAPHICS, and converting other BASICs. Hartnell and Jones use high-quality illustrative programs. Appendices cover utilities such as hexadecimal conversion, bytes remaining, and how to simulate 2K memory with more memory attached. Program listings read exactly like your TV screen.

Mastering Your Timex Sinclair Personal Computer challenges the publishing world to provide high quality at low cost, just as the TS1000 challenges other computer manufacturers.

Bob Rettew, Derry, NH

TIMEX MAKES MEDICAL WAVES

Medical science utilizes T/S power in a joint venture between MIT and Harvard Medical School, according to Stephen Burns, technical director of MIT's Biomedical Engineering Center. Burns teaches a course called "Biomedical Instrumentation Electronics" to both Harvard medical and MIT graduate students. The course comprises part of the joint Harvard-MIT Health Sciences Technology program, which combines teaching of technology and medical sciences.

Burns and his students use the TS1000 as a processor for acquiring and analyzing signals from spirometers, used commonly by respiratory therapists to measure air flow when breathing. The TS 1000 measures FEV1, the ratio of total expired air volume to the fraction expelled in the first second. Combined with an analog device, the Timex quantifies signals from a pressure transducer and stores them in memory, using Zilog DMA chips.

Why did Burns choose the TS 1000 to illustrate process control? "It's cheap, but as powerful as any computer available, with functionally complete BASIC," Burns said.

Course members designed an interface and added 2K memory using static RAM chips. Future plans may include implementing a PROM program and using a large scale integrated circuit to completely control the instrumentation. "The Sinclair may allow us to program this chip to mediate data transfer and perhaps control timing," Burns said.

Several of his English colleagues use the Spectrum as teaching tools and instrument controllers, Burns added.

For information about Burns' course (HST70) or further technical details, write to Burns at MIT, Biomedical Engineering Center, 18 Vassar St., Rm. 20A-119, Cambridge, MA 02139. SYNTAX hopes to publish further details.--LFV

BYTE-BACK modules

NEW LOW PRICE

64-K MEMORY

With Battery Backup

\$109.95 KIT



\$119.⁹⁵ ASSEMBLED & TESTED

the "ULTIMATE MEMORY" UM-64

FEATURES:

- Battery Backup - Computer and full 64-K Backed
- PROM/ROM socket
- Reset Switch-Reset without destroying Program
- BYTE-BACK EXCLUSIVE FULL 64-K

The 0-8K area is available. You can execute a copy routine (provided) to copy the TIMEX ROM into the 0-8K area of RAM then flip a switch and you have your operating system in RAM. You can modify it and create your own customized operating system. Full details, examples & programs included.

**WHY PAY MORE FOR LESS FEATURES?
GET THE "ULTIMATE MEMORY"
BYTE BACK'S UM-64**



NEW ZX PRO/FILE

Clearly the Best File Management Program Available.
This New Program is what the Timex has been waiting for.

Cassette & Book
including shipping
\$16.95

At **BYTE-BACK** we have used & evaluated almost every data organizer & Data File Program on the market & we were not really impressed until we tried **Thomas Woods' NEW ZX PRO/FILE** Program. It is truly the best piece of software we have seen for the Timex Computer. We now use it to help run our business. This program is so FAST that even when the program is full the file you want is on the screen within a second.

The ZX PRO/FILE has features not found on the other Data File programs. It has: **FILE ANALYSIS** function which allows you to count, analyze frequency, % etc. Capability to create **FILES OF ANY SIZE** in the same program. **MULTIPLE WORD SEARCH**, excellent **ADD/EDIT** features. **ORDERED FILE OUTPUT** based on any numerical value contained in the files. **DEFINABLE PRINTER FUNCTIONS & AUTO SEARCH**. Works with both **16K & 64K** memory.

FREE 59 page BOOK. This book alone is worth the purchase price. ZX PRO/FILE's machine language concepts & methods are fully explained. It includes a complete **PROGRAM LISING** & detailed explanation of how the program works & how it can be easily modified. It also includes a machine language programming section.

16 K MEMORY UM-16 \$59.95 KIT \$69.95 assembled & tested

Battery backup, reset switch, PROM/ROM socket PLUS...

1 year, 100% trade-in credit towards the UM-64.

RS-232 Module \$59.95

ASSEMBLED & TESTED \$69.95

Drives the Gorilla/Banana & Other Serial Printers

ALL MODULES CARRY 90-DAY WARRANTY

TRY BYTE-BACK MODULES FOR 10 DAYS WITH NO OBLIGATION

ALL NEW MD-2 SMART MODEM

In Stock!

\$119.95 KIT

ASSEMBLED & TESTED \$149.95

With New **SMART**, Menu Driven SOFTWARE included FREE.

- Send and receive Programs by Phone
- Copy Information into memory from a Host Computer (such as **CompuServe**), Print it, Review it, Save it on Tape, Send Text from Memory.
- Use Timex 2040 Printer or Any RS-232 Printer
- RS-232 Printer Port provided.
- No extra memory Required, But with 64-K Memory You Can Store Up To 60 Full Screens

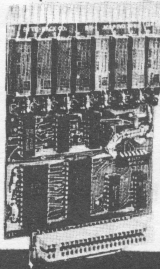
COMPUSERVE PACKAGE WITH 5 FREE HOURS ONLY \$39.95

BYTE-BACK'S BB-1 CONTROL MODULE

\$59.00 KIT In Stock!

ASSEMBLED & TESTED \$69.00

- 8 Independent Relays (with LED status indicators)
- 8 Independent TTL Inputs (with Schmitt trigger buffers)



• By using a single POKE command you can change and latch the status of each of the 8 relays.

• Your computer can read the status of all 8 inputs by the use of a single PEEK command.

• A comprehensive manual is included that has complete application details.

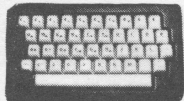
• More than one BB-1 can be used at a time.

NEW Gorilla/Banana Printer

Prints on Standard Paper. 80 Columns Discounted to only
Specify Serial or Parrallel.

\$239.95

See "Leading Edge" Ads



BYTE-BACK KEYBOARD \$59.95

We use the same key switch found in the expensive computers such as: Hewlett Packard, Texas Instruments,

Atari, D.E.C. etc. The multi-colored key caps are the same type used on the IBM Personal Computer, but with the TIMEX legens.

EXPERIENCE QUALITY

Shipping and Handling \$4.95

EXCEPT ZX PRO/FILE

ORDER PHONE (803) 532-5812

ITEMS ORDERED: _____

Bill My Am. Exp. Visa M/C
Checks Accepted

Exp. Date _____ Card No. _____

Name _____

Address _____

City/State/Zip _____

Phone _____

Dealer Discounts Available

Mail To: **BYTE-BACK CO.**
Rt. 3, Box 147, Brodie Road
Leesville, S.C. 29070



POKE DOWN AND ABBREVIATED SAVE/LOAD

With a 16K RAM pack, you can't help but notice longer SAVE and LOAD times compared to a 1K or 2K machine. And when a program written with extra memory attached is published, it is often listed as 16K, regardless of its true length.

To avoid both problems, try this: Before starting a program, execute (without line numbers) POKE 16389,68 and NEW. No matter what your RAM, this process makes RAMTOP 17408, or 1K. (The other value used to determine RAMTOP at address 16388 is always 0 unless otherwise POKEd.)

With the computer now limited to 1K, begin writing. If your program fits and runs, it is a 1K routine. If 1K is not enough and you have more than 1K attached, SAVE what you have. Now POKE 16389,72 and execute NEW. Load your SAVED program. Your computer now has 2K (with 16K you can unplug or POKE 16389,128 to restore 16K).

What if you already SAVED your program using 16K? For sure it will not LOAD into less memory. So, LOAD it into 16K. Then execute CLEAR and PRINT PEEK 16396+PEEK 16397*256. If the number displayed is under 17408, the program fits into 1K; under 18431 fits in 2K.

Of course, just because it fits doesn't mean it will run. IF you RUN it and PRINT PEEK 16412+PEEK 16413*256 still yields a number under 17408 for 1K or 18431 for 2K, it probably will run in that memory. The only way to know is to LOAD it into 1K or 2K and RUN.

This requires making a 1K or 2K SAVE from your present 16K version so you can LOAD it into lesser memory. With the 16K version LOADED, execute CLEAR and POKE 16389,68 for 1K or POKE 16389,72 for 2K. Then SAVE. You now have a 1K or 2K SAVE. Now execute NEW to set the computer to the limited memory, LOAD the just-saved routine into the smaller memory and RUN.

As you do this procedure, you surely notice the shorter SAVE and LOAD times. You can abbreviate a SAVE to include just the program portion of any length routine by executing CLEAR then POKE 16388, PEEK 16396 and POKE 16389, PEEK 16397 then SAVE. The resulting shorter SAVE loads into 16K just as quickly as it SAVED. After the SAVE, unplug or POKE 16388,0 and POKE 16389,128 to restore 16K.

Rolf L. Miller, Ventura, CA

ARCHER--8K/16K

Test your archery skills and learn some fundamental physics at the same time. ARCHER simulates the effects of gravity, angle and velocity on bow-and-arrow trajectory. Type in the program and RUN. Decide how many arrows you wish to shoot (the fewer tries, the higher the score if you hit the target). ARCHER tells you the target distance, which varies from round to round. Then input the angle and velocity you think necessary to hit the target. Angles must fall between 15 and 89 degrees, and velocity between 50 and 99 feet per second. Enter these together; i.e., 5060 for angle of 50 degrees, velocity of 60 fps.

ARCHER next draws your target, and shoots your arrow with a TWANG. It must land within three feet of the target. (On-screen, the numbers represent the target.) In the following example, our assistant editor scored a bullseye.



The computer calculates the yardage you over- or undershot, and lets you try again until you use up your arrows. You can play as many times as you like, and many people

DRUGS & BUGS

An Antibiotic Selection Program

For Physicians On Tape

TIMEX-SINCLAIR 16K

Easy • Fun • Educational

Send name and address with \$39.00 to:
William D. Loeser, M.D.
1871 Coronado Ave.
Youngstown, Ohio 44504

can play; ARCHER lists the high scorer as the score to beat before each player's turn. ARCHER prints the cumulative score at the end of each round. (ARCHER does not list individual scores for rounds; you must subtract previous scores to get separate round totals.)

Variables

G=acceleration of gravity (fps)
N=number of arrows chosen
D=target distance (yds.)
S1=scaled down distance
S2=trajectory plot
L=loop counter
B\$=angle, velocity input
X=loop counter
A=angle (convert to radians)
R=arrow travelling distance
H=arrow height
T1=loop end value
K1=factor to plot X-axis
K2=factor to plot Y-axis
K3=factor to plot Y-axis
X=X in plot statement
Y=Y in plot statement

T=loop counter
SCORE=score of round
FINAL=final score
Z\$=response to prompt

Lafayette Bagley, Los Angeles, CA

```
1 REM ** ARCHER, COPYRIGHT
(C) 1983 BY LAFAYETTE R. BAGLEY,
ALL RIGHTS RESERVED **
2 REM
3 REM ** INITIALIZE **
4 LET FINAL=0
5 CLS
10 RAND
15 LET G=32.2
20 PRINT "HOW MANY ARROWS DO YOU WANT?"
30 INPUT N
32 LET D=INT (1E2*RND)+50
33 LET S1=98/D
34 LET S2=S1*.5
36 REM ** MAIN LOOP **
40 FOR L=1 TO N
44 GOSUB 1000
45 CLS
50 PRINT "YOUR TARGET IS ";D;"
YARDS AWAY"
60 PRINT "ANGLE, VELOCITY (FPS)
?"
61 INPUT B$
62 IF LEN B$<4 OR LEN B$>4 THE
N GOTO 60
63 FOR X=1 TO 4
64 IF CODE B$(X)<28 OR CODE B$
(X)>37 THEN GOTO 60
65 NEXT X
66 IF VAL B$(1 TO 2)<15 OR VAL
B$(1 TO 2)>89 OR VAL B$(3 TO 4)
<50 OR VAL B$(3 TO 4)>99 THEN GO
TO 68
67 GOTO 70
68 PRINT "A: 15>=A<=89; V: 50>
=V<=99"
69 GOTO 60
70 CLS
75 REM ** CALCULATE DISTANCE,
RANGE, AND HEIGHT ARROW WILL
TRAVEL **
80 LET A=(VAL B$(1 TO 2))*PI/1
80
90 LET V=VAL B$(3 TO 4)
110 LET R=V*V*SIN (2*A)/G
120 LET H=(V*SIN A)**2/(2*G)
130 REM ** DRAW FIELD **
210 FOR X=0 TO 63
230 PLOT X,0
240 NEXT X
280 PRINT AT 21,24;D;" YDS"
290 PRINT AT 5,12;" ANGLE"
291 GOSUB 1500
293 PRINT AT 5,12;" "
300 REM ** SCALE DOWN VARIABLES
**
310 LET T1=2*V*SIN A/G
320 LET K1=S1*V*COS A
330 LET K2=S2*V*SIN A
340 LET K3=G*S2/2
345 REM ** PLOT TRAJECTORY **
350 FOR T=0 TO T1 STEP T1/50
360 LET X=INT ((K1*T+2.5)/2)
370 LET Y=INT ((K2-K3*T)*T+2)
```

```

380 IF Y>43 OR Y<0 OR X>63 OR X
<0 THEN GOTO 395
390 PLOT X,Y
395 NEXT T
410 PRINT AT 0,12;"KERPLOG"
411 GOSUB 1500
412 PRINT AT 0,12;"
"
415 REM ** TEST FOR HIT **
420 IF ABS (R-D)<3 THEN GOTO 51
4
427 REM ** CHECK FOR OVER OR
UNDER AND PRINT RESULTS **
430 IF (R-D)<0 THEN LET T#="UND
ERSHOT"
435 IF (R-D)>0 THEN LET T#="OVE
RSHOT"
436 PRINT "YOU ";T#;" BY ";INT
(ABS (R-D)*100)/100;" YDS"
440 PRINT
450 PRINT "YOU HAVE ";N-L;" ARR
OW(S) LEFT..."
460 NEXT L
470 REM ** OUT OF ARROWS **
497 PRINT "YOU'RE OUT OF ARROW
S--SCORE= 0"
498 GOTO 527
500 REM ** CALCULATE SCORE **
514 PRINT AT 5,10;"** HIT **"
515 GOSUB 1000
516 CLS
517 PRINT "YOU USED ";L;" OF YO
UR ";N;" ARROWS"
518 PRINT "YOUR SCORE IS: ";
519 LET SCORE=INT (100*(12-L)/(
L*N))
520 LET FINAL=FINAL+SCORE
525 PRINT INT FINAL
527 REM ** PLAY AGAIN? **
530 PRINT AT 10,0;"
"
531 PRINT AT 10,5;"PLAY AGAIN (
Y/N)?"
540 INPUT Z#
550 IF Z#="Y" THEN GOTO 9
560 GOTO 1600
999 REM ** DELAY LOOPS **
1000 FOR 0=1 TO 25
1010 NEXT 0
1020 RETURN
1500 FOR 0=1 TO 15
1510 NEXT 0
1520 RETURN
1600 CLS
1605 REM ** SOMEONE ELSE? **
1610 PRINT AT 21,0;"DOES SOMEONE
ELSE WANT TO? (Y/N)"
1620 INPUT Z#
1630 IF Z#="Y" THEN GOTO 1700
1635 REM ** PRINT SCORE-STOP **
1640 PRINT AT 10,7;"FINAL SCORE
=";FINAL
1650 STOP
1660 REM ** PRINT HIGH SCORE
-NEXT PERSON PLAYS **
1700 PRINT AT 10,7;"HIGH SCORE =
";FINAL
1710 PRINT AT 11,7;"BEAT THAT...
?"
1714 REM ** BACK TO SQUARE ONE *
*
1715 GOSUB 1000
1720 RUN
SYNTACTIC SUM: 25818, 8K ROM

```

VENDOR REPORT AND NOTES

Barlog Software will not offer the 64K RAM module kit as announced in SYNTAX (Jul.83 p.2). Assembled RAMs are still available. Barlog Software, 401 N. Geyer Rd., Kirkwood, MO 63122.

Free MC wall charts are no longer available from Henri Poche, as listed in SYNTAX (Feb.83 p.2). Contact Henri if you did not receive one and want a refund of your 35c postage. Henri Poche, 5751 River Rd., New Orleans, LA 70123, 504/733-8575.

ZX PRO/FILE manuals are delayed until early August due to printer's illness, reports Tom Woods. Contact Tom at POB 64, Jefferson, NH 03583, 603/444-5014.

Biocal Software offers replacement tapes to anyone who purchased un-loadable tape from them before April, 1983. BIOCAL says it corrected the problem with equipment upgrades. Send bad tape + \$1 P&H to receive updated documentation, and program on BASF Data-Trac tape. Contact Biocal at their new office at 167 Wilson St., Petaluma, CA 94952, 800/237-8400 x70.

Quicksilva Ltd. of Southampton, UK announces the opening of a US office to handle North American Quicksilva software manufacturing and marketing. Quicksilva, Inc., 426 W. Nakoma, San Antonio, TX, 512/492-8054.

Memotech's RS232 interfaces, back-ordered since Mar., are now available for \$99.95 and in plentiful supply in the US. Memotech also introduces a new direct-connect modem, \$149.95. Package deal: RS232 (includes communication software), modem, cable plus two hours on CompuServe, \$199.95. Memotech, 7550 W. Yale Ave., Suite 220, Denver, CO 80227, 303/986-1516.

DUELING DEVICES

Many new peripherals for ZX/TS computers now use I/O addressing. Why? Two main reasons: add-ons already use most "good" memory areas, and even 2K machines can access I/O devices, making them usable without extra memory. This helps reduce costs significantly.

But because I/O manufacturers keep costs low, they must rely on partial decoding of port addresses. Z80 processors can address 256 unique I/O devices (256 inputs and 256 outputs) using lines A_0 - A_7 on the address bus. Each time we fail to use a line to decode, we cut the number of assignable ports in half. For example, if we do not use A_7 as part of our device, we can only address 128 unique devices.

A7	A6	A5	A4	A3	A2	A1	A0
X	1	1	1	1	1	1	1

(X = not used)

In the above diagram, we show address 127_(D), or possibly 255_(D), since we don't use A_7 . Of course, we must also use IOREQ NOT, and either RD NOT or WR NOT to tell the system we are requesting an I/O port. For any port, we must have at least two lines in our selection logic. To fully decode a port, we need eight more lines, totalling ten. This could require a fairly expensive chip or decoding device.

To cut costs, we only choose a few of the address lines. See the following diagram of two currently available I/O devices.

#1	A7	A6	A5	A4	A3	A2	A1	A0
	0	X	0	0	X	X	X	X

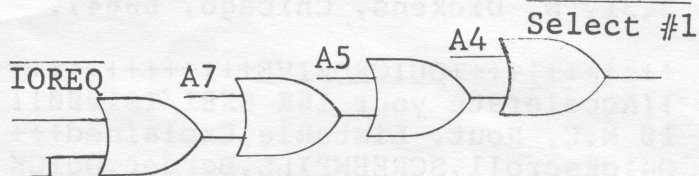
Addresses: 0-15_D and 64-79_D

#2	A7	A6	A5	A4	A3	A2	A1	A0
	0	0	0	X	X	X	X	X

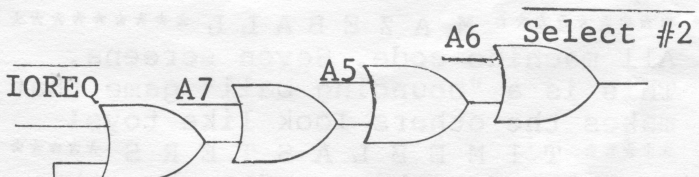
Addresses: 0-31_D

You can decode these devices cheaply, but they overlap. Problems could develop if you attach both devices at the same time, unless you make sure to use non-overlapping addresses. Clearly, we should not use addresses 0-15 in the example shown. You should select device #1 using the 64-79 area, and device #2 should use a code from 16 to 31.

Decoding schemes for devices #1 and 2 follow. Implementation of this entire decoder in a single 25¢ chip, the 74LS28 Quad OR gate provides one big advantage. But we effectively eliminate a large number of potential addresses--a disadvantage. In both examples, we lose 31 possible ports to get one.



RD
Device #1



RD
Device #2

Although keeping costs low by using partial decoding schemes remains important to ZX/TS suppliers and consumers, manufacturers should provide port address ranges in product information and advertising. I suggest you contact vendors before you buy, to determine the compatibility of any new peripheral with those you already own.

Paul Donnelly, Centerport, NY

Remember that the ZX/TS uses all even port addresses to read the partially decoded keyboard, though it's always called as 00FEh.--KO

CLASSIFIED ADS: Reach nearly 10000 ZX/TS users for \$9/line. Send typed copy, 35 char/line, with check by 15th of month for next month's issue. To rerun, resubmit ad with check. SYNTAX, RD 2 Box 457, Harvard, MA 01451.

* * * * * Keep medical records
* FAMILY * of family members -
* HEALTH * Doctor Visits, Shots,
* RECORDS * Prescriptions, & more!
* * * * * 16K & 64K Versions.
\$12.95 (.83 NY tax) PYRAMID SOFTWARE
Box 813-1, Pearl River NY 10965

Into Algebra & Graphs? 16K program graphs and solves most algebraic equations. Send \$3 for explanation, listing & cassette to Fraser-Smith, 3431, W. Dickens, Chicago, 60647.

+++++QUICKDRIVE+++++
!!Accelerate your 16K ZX81/TS1000!!
10 M.C. Rout. Listable, Explained++
Quickscroll, SCREENFILL, Border, QUICK
DRAW, Inverse, more. ORDER NOW!! SEND
\$12.95 to MICRO-LOAD/505 E. 3rd. #A-5
+++++Truth or Conseq., NM 87901++++

***** M A Z E B A L L *****
All machine code. Seven screens.
This is a "bouncing ball" game that
makes the others look like toys!
***** T I M E B L A S T E R S *****
Over 3K of machine code makes this
the best of all the graphics space
wars---For serious arcade players!
***** M E T A G R A P H I C S *****
At last you can create elaborate
pictures using over 2000 different
graphics characters. BASIC and M/C.
All cassettes run on ZX81 or TS1000
/1500 (16K RAM). \$12.95 (US) for 1
or \$24.95 for all 3, postage paid.
Money back if you're not delighted.
***** CALLIOPE SOFTWARE *****
4130 Coe Dr. NE, Albuquerque, NM 87110

UN-LOCK NEW 1 LINE BASIC PROGRAM
WILL HALT AUTO EXECUTION OF M/C,
BASIC PROGRAMS, SO THEY MAY BE SAVED
FOR LISTING & INFO, SEND \$5. TO C.
TRAHAN c/o SHUTTLE SOFTWARE GROUP
PO BOX 71; SEABROOK, TEXAS 77586

BUSINESS GRAPHS 6 16K programs,
9 Springbrook, Sacto., CA95831

* * * * ROMPAK NEEDS YOU! * * * * *
* Serious & Amateur TS Programers *
* We'll help your creation EARN \$ *
* Details? Call NOW! 213-653-9741 *
* or send for confid form: ROMPAK *
* 8206 Blackburn Ave L.A. CA90048 *

*BIORHYTHMS! Charts rhythms, checks
compatibility, signals critical days
Files by name; ONLY \$15.95. ALSO ZX
BASIC coding forms 50/pad ONLY 2.25
+.75P&H/pad. CAPRICORN, 25 George
St. S., Toronto, Canada, M5A 4B1

BUDGET ANALYSIS ZX81 16K tape \$15 U.S.
Includes daily+monthly budget re-
ports. NOMIS COMPUTERS 11121 82 Ave
631, Edmonton, Alta., Canada T6G 0T4

NEW LOW PRICES FOR WINKY BOARD II!
Make LOADING easy. Copy ANY ZX/TS
cassette + more! \$19.95 built/tested
\$14.95 kit + \$1.50. Simple to use.
SOFTWARE: KEY unlocks any ZX/TS
cassette, MERGES + more \$10 PPD; HRP
for 256x192 res. print outs \$10 PPD;
ZXLR8 for 6-10x faster LOAD \$11 PPD
G. RUSSELL-ELECTRONICS, RD1 Box 539
Centre Hall, PA 16828: 814-364-1325

* PLUG IN YOUR TIMEX/ZX PROJECTS *
3-SLOT FULLY ASSEMBLED MOTHERBOARD
ACCEPTS RADIO SHACK AND VECTOR
PLUGBOARDS, PLUS ALL SINCLAIR HRDWR.
\$29.95 JDC 5-14 SENTINEL RD. DOWNS-
VIEW ONT. CANADA M3M 2Y5

CHECKBOOK RECORD & BALANCER. Store 200
checks (16K). Only \$3 To Scott Wolf
4949 Webster Rd, New Haven, IN 46774

*** C-FOOTBALL *** ZX81/TS1000 (16K)
CALL PLAYS AGAINST ANY OF THREE
INCREASINGLY SOPHISTICATED DECISION
MAKING LEVELS OF THE COMPUTER \$14.95
STARTLINGLY REALISTIC. DKN BOX 8477
ATLANTA GA. 30306

CUSTOM PROGRAMMING
ONLY \$5 per order. Send your specs.
Include memory size. To: Scott Wolf
4949 Webster Rd, New Haven, IN, 46774

SYNTAX is published monthly by a wholly-owned subsidiary of The Harvard Group.

Syntax ZX80, Inc.
RD 2, Box 457, Harvard, MA 01451. Telephone 617/456-3661.
12 issues, \$29. Single issue, \$4.

Publisher: Kirtland H. Olson
Editor: Ann L. Zevnik
Assistant Editor: Lisa Fass Vivat
Technical Consultant: Richard Kelly

© Syntax ZX80, Inc., 1983. All rights reserved.
Photocopying prohibited. ISSN 0273-2696

OUR POLICY ON CONTRIBUTED MATERIAL

SYNTAX invites you to express opinions related to any Sinclair computer or peripheral, or the newsletter. We will print, as space allows, letters discussing items of general interest. Of course, we reserve the right to edit letters to a suitable length and to refuse publication of any material.

We welcome program listings for all levels of expertise and written in either Sinclair BASIC or Z80 machine code. Programs can be for any fun or useful purpose. We will test run each one before publishing it, but we will not debug programs; please send only workable listings. Programs submitted on cassette can be tested more quickly and with less chance of error.

In return for your listing, we will pay you a token fee of \$2.00 per program we use. This payment gives us the nonexclusive right to use that program in any form, world-wide. This means you can still use it, sell it, or give it away, and so can we.

We will consider submissions of news and hardware or software reviews. Please keep articles short (350-400 words). Again, we reserve the right to edit accepted articles to a suitable length. We will pay 7 cents per 6 characters, including spaces and punctuation, for accepted articles.

When you send in programs for possible publication in SYNTAX, please include the following information:

- How to operate the program, including what to input if it does not contain prompts.
- Whether you can run the program over again and how.
- How to exit the program.
- The Syntactic Sum (program published in Feb. 81 and Jun. 81; send SASE for a free copy).
- What RAM size program requires.
- What ROM program uses.

We pay for this explanatory text at the same rate as for articles in addition to payment for the program itself.

If you want us to return your original program listing or article, please include a self-addressed, stamped envelope. Otherwise, we cannot return submitted material.

Fill out the coupon below and mail it to: SYNTAX/SQ, RD2 Box 457, Harvard, MA 01451

My check is enclosed. Please charge my VISA

Make checks payable to: Diner's Club American

SYNTAX ZX80, Inc. Express Mastercard

Carte Blanche account

Account number _____

Exp. date _____ Bank number (MC only) _____

Signature _____

Name _____

Address _____

City _____ State _____ Zip _____

Day phone () _____ Evening phone () _____

My subscription number is: _____

This is a new subscription.

MY TYPE..THE touch typing tutorial, 16K cassette, \$8. (ZX-TS)
BIG-KEY..Dry-transfers in red&blk.
LEGENDS for std. keycaps. \$7./set.
/////////////////DAYDESIGN/////////////////
790-B E.Big Beaver Troy Mi. 48084

****TEXTWRITER 1000****
FULL TEXT EDITING-EASY TO USE. TAB, BLOCK SAVE,AUTO TEXT ALIGN,ZX/TIMEX PRINTER. \$11.95 TAPE-BOB FINGERLE BOX 7793, FREMONT CA 94537-7793

**** TECHNICAL APPLICATIONS ****
Software for electronic CAD and formulas. All in BASIC, on tape, with comprehensive instructions. Send SASE for a list of programs and prices to: SofTec, P.O. Box 432, Fairport, New York 14450

AIRPLANE INSTRUMENT FLIGHT SIMULATOR program.VOR,DME,ADF RADIOS. MAP display.Multi-leg,ILS APPROACH.Cassette for Timex 1000,16K computer. Send \$12.95 to Amanda Systems, P.O. Box 118, Holmdel,NJ 07733

DISCOUNTS #####
TS2000 Color Computer send SASE
2040 Printer \$93;paper 3/\$6,24/\$44
SEIKOSHA printer pkg \$319; 80 column printer \$185;Plug in kybd w/ space bar \$66;FASTLOAD \$12;MUCH MORE..modems,books,TS2000hard/software.For IMMED. UPS del,send checks to:SIMPLY SINCLAIR Box S Wdbg.,VA 22194 MC&Visa call (703)690-3798

- YES! Please send me:
- The Combination II (13 issues of SYNTAX and SQ Winter 82-Summer 83) \$39
 - The Catch-up II (SYNTAX Jan. 82-Jan. 84, SQ Winter 82-Summer 83, plus 1 binder) \$77
 - The Works II** (SYNTAX No. 80-Dec. 83, SQ Winter 82-Summer 83, plus 2 binders) \$97
 - 12 issues of SYNTAX \$29
 - 3 issues Syntax Quarterly (Winter 82-Summer 83) \$25
 - 1 issue Syntax Quarterly Winter 82 Spring 83
 Summer 83 \$9
 - 1 Binder \$9 1 issue of SYNTAX \$4

Telephone orders call

617-456-3661

These offers expire 30 Sept. 83—SUBSCRIBE NOW.

***** FAST LOAD/SAVE PROGRAM *****
 * >>> Z-XLR8 (Z-accelerate) <<< *
 * A Software Based Tape System for *
 * 16K ZX81 & TS1000. 6-10 X Faster *
 * LOAD/SAVE. Create Program, Data, *
 * Binary, & Graphics Files. Z-XLR8 *
 * Takes < 2K RAM & is Completely *
 * Relocatable! No Hdwre Additions! *
 * Cassette \$11.00 ; EPRO \$21.00 *
 * ADVANCED INTERFACE DESIGNS *
 * P.O. BOX 1350 *
 * STATE COLLEGE, PA 16801 *

FREE SOFTWARE BROCHURE- Send SASE.
 HOUSEHOLD BOOKKEEPER*CALENDAR PLAN-
 NER*SYNC INDEX*BIO-RHYTHMS*KEY COL-
 LORS- LISTINGS \$3 CASSETTE'S \$7.95
 I.M.S. Box 4503 Lancaster, Ca. 93539

ALARM! ZX81 BECOMES \$1000 BURGLAR/
 FIRE SYSTEM, CASSETTE & INFO \$29.
 SOFTSKID BX 5097 GREENSBORO, N.C.
 ZIP 27403. PIANO, MUSIC PROGRAM \$7

 5 Top Quality programs on cassette
 tape, ready to load and run. Only
 \$5.00. Send no money now. Send a
 Self-addressed stamped envelope to:
 Original Programs, 3763 W. Crocus
 Dr. Phoenix, Arizona 85023
 #####

COMPUNETTE is a Norelco-boxed and
 labeled C-10 cassette which is
 especially designed for micro-
 computer application by TAPEMASTERS
 25 for \$20.00 100 for \$70.00
 COMPUNETTE+ is a C-20 cassette
 25 for \$22.50 100 for \$80.00
 COMPUDISK is a SS, DD, Soft Sector
 5 1/4 In. Disk 10-\$23.00 50-\$110.00
 VISA MASTERCARD C.O.D.
 TX 214-349-0081**OTHER 800-527-1227
 10% Discount for Check with Order
 PO Box 38651W Dallas, Texas 75238
 FREIGHT PREPAID*DEFECTIVES REPLACED

Ramdisk for \$12.50? Its MICRODRIVE!
 Use & store 8 FULL 2K progs AT ONCE
 in 16K: fastsave, autoloader, instant
 access, all MC. BAFFLEBALL! Fastest
 MC 2K arcade game ever, \$5.50. FREE
 PROG & CAT: SASE to RHEESWARE, 4001
 Pennwood #3, Las Vegas, Nev. 89102

*** HALF-PRICE SALE ***
TOTAL YOUR ORDER & SEND ONLY HALF
 PREDICT NFL GAMES
PICK'EM.....19.95
 ANIMATED ADVENTURE FUN
CAVES OF ZULU.....19.95
 HELP WITH DECISION-MAKING
MULTI-ATTRIBUTE ANALYSIS.....19.95
 ORDER FROM STUART SOFTWARE 25381-G
 ALICIA PKWY STE 316 LAGUNA HILLS CA
 92653 ADD 2.00S/H PER ORDER VISA/MC
 *** (714) 855-4753 ***

SYNTAX

THE HARVARD GROUP

Bolton Road, Harvard, Mass. 01451

First Class

U.S. Postage
 PAID
 Harvard, MA
 Permit No.8
 01451

MR WILLIAM TOMLINSON 58 68
 3635 RIVEREDGE DR.
 JACKSONVILLE FL 32211